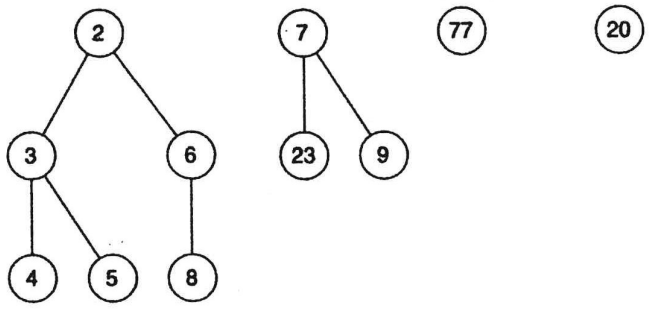
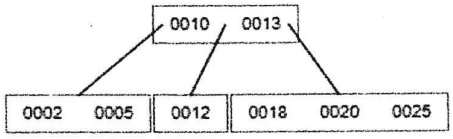
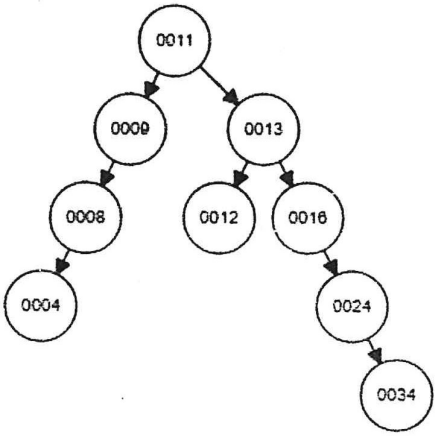
SVKM's
D. J. Sanghvi College of Engineering

Program: B.Tech in Information Technology **Academic Year: 2022** **Duration: 3 hours**
Date: 12.01.2023
Time: 10:30 am to 01:30 pm
Subject: Advanced Data Structures (Semester V) **Marks: 75**

Question No.		Max. Marks
Q1 (a)	Compare B-Tree and B+ Tree. **OR** Differentiate bloom filters and count min sketch based on their applications.	[05] [05]
Q1 (b)	Discuss amortized analysis and its significance. Compute the amortized complexity for multi pop stack using accounting method.	[10]
Q2 (a)	Construct the Red-Black tree for the following elements. 38, 13, 51,10,12,40,84,25 **OR** Perform the merge operations on following Fibonacci heaps and perform the extract min operation on merged heap. Also discuss the complexity of the same. 	[10] [10]
Q2 (b)	Construct a standard tries for the given sample text S= {ab, aba, abc, ad, ba, bad, bag}	[05]
Q3 (a)	In the given B-tree, perform following operations — order of Tree = 4  Insert (30) Insert (7) Insert (9)	[10]

	Delete (13) Delete (5)	
Q3 (b)	Explain leftist heap with suitable example. **OR** Discuss the pros and cons of height balanced trees.	[05] [05]
Q4 (a)	Explain k-d trees. Also discuss various applications of k-d trees in detail. **OR** Explain cuckoo hashing with suitable example	[10] [10]
Q4 (b)	Delete node 13 and 7 from following Splay Tree.  	[05]
Q5 (a)	Create a segment tree for ~~max~~ min range query for the following data (15, 25, 60, 70, 6, 16, 4, 14, 20, 92). Also use the segment tree to determine range queries min (3,8) and min (2,5).	[10]
Q5 (b)	Write short note on double ended heap. **OR** Write short note on Merkle trees.	[05] [05]